Claims:

1. A non-invasive method for selectively determining the concentration of at least one gas component in a gas mixture contained in a closed spacing (1) having at least one transparent, dielectric wall (2a, 2b), comprising:

- locally applying rapidly alternating high voltage to the spacing to provide localized light emission (3) in an emission area;
- collecting emitted light of the local emission (3) from a collection area larger than the emission area;
- determining the intensity of at least two different spectral intervals, at least one of which corresponds to the gas component of interest;
- calculating the ratio between the intensities of two spectral intervals, one of which corresponds to the gas component of interest; and
- determining the concentration of the gas component of interest from said ratio.

2. The method according to claim 1, wherein the spacing (1) comprises two glass walls formed by two glass sheets (2a, 2b) spaced apart from each other.

3. The method according to claim 2, wherein the spacing comprises a gas-filled window glazing unit (1).

4. The method according to claim 1, wherein a grounded counter-electrode is used.

5. The method according to ~~any of claims 1 to 4~~ claim 1, wherein alternating high voltage is applied to the closed spacing using an elongated electrode (5) having a tapered end and by directing said end of the electrode against the closed spacing.

6. The method according to ~~any of claims 1 to 5~~ claim 1, wherein the light of the local emission is collected with a lens (4a) to provide a collimated light beam, said lens being located at a distance of about 0.5 to 3 focal distances from the site of the local emission.

7. The method according to ~~any claim 1 to 6~~ claim 1, comprising determining the intensity of a

first spectral interval corresponding to the gas component of interest and the intensity of a second spectral interval, different from the first spectral interval, said second spectral interval corresponding to the integral emission, to the emission of another component of the gas mixture, or the emission of the same gas component.

8. The method according to claim 6 ~~or 7~~, wherein the collimated light beam is split to provide a first split beam having a signal proportional to the integral discharge emittance and a second beam which is used for measuring a signal dependent on the concentration of one gas component, said split signals being subjected to spectral filtration to measure signals dependent on specific gas components.

9. The method according to claim 8, wherein the collimated light beam is split to provide at least one further split signal used for measuring signals proportional to the concentration of at least one further gas component.

10. A non-invasive method for selectively determining the concentration of at least one gas component in a gas mixture contained in a closed spacing (1) having at least one transparent, dielectric wall (2a, 2b), comprising:

- locally applying rapidly alternating high voltage to the spacing to provide localized light emission (3) in an emission area;
- collecting emitted light of the local emission (3) from a collection area larger than the emission area;
- determining the integral intensity of the emission;
- determining the intensity of a spectral interval corresponding to the gas component of interest;
- calculating the ratio between the intensity of the spectral interval and the integral value of the intensity; and
- determining the concentration of the gas component from said ratio.

11. An apparatus for non-invasive analysis of gas-filled window glazing units (1) for determining the performance thereof, comprising:

- means (7) for creating rapidly alternating high voltage,

- means (5) for locally applying the rapidly alternating high voltage to the spacing of the window glazing unit to achieve local emission;
- means (4a, 6, 4b) for collecting and transporting emitted light;
- means (9a to 9d) for determining the intensities of at least two different spectral intervals, at least one of which corresponds to the gas component of interest;
- means (10b-10d) for calculating the ratio between the intensities of two spectral intervals, one of which corresponds to the gas component of interest; and
- means (12) for determining the concentration of the gas component from said ratio.

12. The apparatus according to claim 11, wherein the means for locally applying rapidly alternating high voltage comprise a needle-like electrode (5).

13. The apparatus according to claim 11, wherein the means for locally applying rapidly alternating high voltage comprise a conductive layer coated on the means for collecting the emitted light, which can be used as an electrode.

14. The apparatus according to claim 11, wherein the apparatus contains a second electrode, which can be grounded and set on the opposite side of the window unit.

15. The apparatus according to ~~any of claims 11 to 14~~ claim 11, wherein the means for collecting and transporting the emitted light comprise a collecting lens (4a) which can be brought in the vicinity of the closed spacing.

16. The apparatus according to claim 15, wherein the means for collecting and transporting the emitted light further comprise optical fibres (6) for transporting the light and a collimating lens (4b) for collimating the light transported by the optical fibres.

17. The apparatus according to claim 16, wherein the optical fiber (6) comprises optical connectors for connecting to the collecting lens (4a), to the collimating lens (4b) and/or to another optical fiber.

18. The apparatus according to ~~any of claims 15 to 17~~ claim 15, wherein the means for collecting

and transporting the emitted light (4a, 6, 4b) are formed as a single non-adjustable block (16).

19. The apparatus according to claim 15, wherein the means (5) for locally applying rapidly alternating high voltage and the lens (4a) are fitted together to form a separate sensor unit.

20. The apparatus according to ~~any of claims 11 to 19~~ claim 11, comprising means (8a-8d) for splitting the collimated light into a first splitted beam having a signal proportional to the integral discharge emittance and at least one second beam for measuring a signal proportional to the concentration of one gas component.

21. The apparatus according to ~~any of claims 11 to 20~~ claim 11, wherein the means for determining the intensity of the spectral interval corresponding to the gas component of interest comprise light detectors (9b-9d) with means (17b-17d) for spectral selection of different characteristic lines of gas components.

22. The apparatus according to claim 21, wherein the means for spectral selection comprise interference filters (17b-17d).

23. The apparatus according to claim 22, wherein the interference filters (17b-17d) have central wave lengths at 467 nm, 587 nm and/or 812 nm.

24. The apparatus according to ~~any of claims 21 to 23~~ claim 21, wherein the means for measuring gas component signals are performed as a CCD camera.

25. The apparatus according to ~~any of claims 11 to 24~~ claim 11, wherein the apparatus contains a sample container for controlling the operational performance of the apparatus as a whole.

26. The apparatus according to ~~any of claims 11 to 25~~ claim 11, further comprising

- data processing means (12) for comparing signals in order to estimate gas composition in the window glazing unit; and

- means (13) for displaying the obtained information.

27. The apparatus according to claim 26, wherein the means for splitting the collimated beam and spectrally selecting the characteristic lines comprise a spectrometer.

28. The apparatus according to claim 27, wherein the means (13) for displaying the obtained information about performance of the window glazing unit is mounted in the remote sensor unit (16) formed by the means for locally applying rapidly alternating high voltage and the lens.

29. The apparatus according to claim 28, wherein the sample container is installed into the remote sensor (4a, 6, 4b), which is provided with an additional light detector and connected with the data processing means (12), whereby the apparatus can be operated so that a high alternating voltage is automatically applied to the sample container in the absence of a discharge through the window glazing unit.

30. The apparatus according to claim 11, comprising means (9a) for determining the integral intensity of the emission and means (9b-9d) for determining the intensity of at least one spectral interval corresponding to the gas component of interest;